Preventing Conflict Through Information Technology

Lieutenant Colonel Timothy L. Thomas, US Army, Retired

"In peace operations . . . perception is reality."[1]

— Kenneth Allard

WHILE ON PATROL in Bosnia, a US Army lieutenant colonel was confronted by an irate Croat who, with an old map in his hand, told the officer that he was on Croation territory. Referring to his own map, the officer replied that he was not and offered to go one step further to prove his point. Taking out his Global Positioning System (GPS), he entered data and showed the Croat the results. "Sir," the officer said, "I have consulted the cosmic tribunal (three satellites) and they have proved me correct. Excuse us, we have to continue with our mission."

Information technology (IT) is often consulted to provide accurate and timely information for a variety of reasons today. IT also has the potential to become a major conflict prevention tool or mechanism. Traditionally, crisis managers and conflict resolution academicians attempted to prevent conflict through diplomatic, economic, cultural and nonlethal means. If these steps failed, the international community deployed military forces to exert pressure on potential combatants. The use of information developments now must be added to this process or progression. IT's data-processing systems connect people, places, concepts and organizations with speed and accuracy, significantly upgrading the conflict prevention methods and integrating other conflict prevention means. Through developments such as the Internet, IT offers the potential to reach both ruling elites and individuals in societies contemplating conflict whether they have access to technology or not.

The application of IT to processes that influence or regulate our lives has spawned a host of new concepts. Perhaps the most important is the concept of "things virtual," which, as but one example, allow people to experience concepts or illusions temporarily simulated or extended by computer software. "Things virtual" explain processes we can see and use but cannot directly touch or feel. Webster's defines virtual reality as "a realistic simulation of an environment, including three-dimensional graphics, by a computer system using interactive software and hardware."[2] Some of these processes are familiar to us—virtual reality games, for example. It is possible to order virtual flowers for loved ones via the Internet; and virtual environments allow scientists to explore molecular structures, architects to walk clients through their designs and Ford Motor Company to teach forge hammer operators how to stamp out connecting rods.[3] Branches of government now study such concepts as virtual diplomacy, virtual justice and virtual communications.

What is Virtual Peacemaking?

It seems only natural then to develop or apply virtual processes that help prevent conflict. Computer simulations, IT use by diplomats in negotiating processes and IT use by militaries to monitor locations or find minefields are just a few of the potential applications. This concept, hereafter termed *virtual peacemaking* (VPM),* is defined as "The use of virtual processes of information gathering, analysis and communication—through the use of IT—for simulated or training exercises as well as real-world scenarios by diplomats, mediators, negotiators, military leaders and other individuals or groups to end a dispute and resolve the issues that led to it before conflict occurs."[4] The definition of peacemaking was taken from the 1997 version of

**The term* virtual peacemaking *appears in this article more than 50 times. For brevity, we use the acronym* VPM. *Readers should understand that* VPM *is not an approved acronym.—Editor*

US Army Field Manual (FM) 101-5-1, *Operational Terms and Graphics*. Here, peacemaking is defined as "the process of diplomacy, mediation, negotiation or other forms of peaceful settlements that arrange an end to a dispute and resolves issues that led to it."[5] Peacemaking, in the opinion of the US Army's Peacekeeping Institute at Carlisle, Pennsylvania, refers to the term as used in FM 101-5-1 but, in addition, encompasses military support to preventive diplomacy as incorporated in the umbrella concept of peace operations.

The most important part of this definition is the last few words—that the use of these processes will happen *before* conflict occurs. Also of importance is the term IT, which forms the core element of VPM processes and is often used as a specific reference point by discussants of conflict prevention who do not use the broader term VPM.

This article focuses on the military aspect of VPM, those virtual ITs the military can use to prevent conflict. First, it discusses the goals, interests and value of VPM. Second, it discusses the environment in which militaries conduct operations today and the applicability of virtual peacekeeping to this environment. Third, it discusses the IT available. Finally, the limitations, problems and dangers involving the military use of VPM are explored. An extended version of this paper discusses the uses and modeling of conflict prevention, and where the concept of VPM could make its biggest impact. The extended paper can be reviewed on the Foreign Military Studies Office home page at: <http://leav-www.army.mil/fmso/>, or you can contact me directly at e-mail: <thomast@leav-emh1.army.mil> or (913) 684-5957.

It will be useful to review a related IT use that served as the catalyst for the idea of VPM before beginning the detailed examination. This use was the crafting and implementing of the *Dayton Peace Accords* negotiation process, which allowed the international community not only to manage the Bosnian crisis but also to find some resolution. So far, the process has successfully endured the challenges to peace for nearly two years. Future historians will look on the accords as the first major successful application of IT to assist in the conflict prevention process, in this case via "virtual crisis management."

The *Dayton Peace Accords*

After nearly three years of fierce fighting among the factions in the former Yugoslavia, the international community finally persuaded the presidents of Bosnia, Croatia and Serbia to sit down together and discuss how they could end the bloodshed. This meeting took place at Dayton, Ohio, in the fall of 1995. IT played a prominent, even decisive role in convincing the three leaders that the accords would be administered fairly and without prejudice. Mapping and satellite data were the two IT pieces used most often. Similar procedures could prove useful for VPM, it appears.

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A huge TV screen was located in the room where these leaders met. A replica of the conference working map on the table in front of them was shown on the screen. This allowed the leaders to keep their fingers on the changing Inter-Entity Boundary Line that marked where their countries' boundaries would lie. This was the chief area of contention. Mappers digitized the line and imported the information into a terrain visualization system called *PowerScene*, an advanced software architecture for terrain visualization, showing a 3-dimensional (3-D) terrain perspective to depict where the line apportioned the land. Negotiators could also use the system to further refine the proposed line. For example, if the line cut through a building, the line could be moved to either side of the building and viewed on the screen.[6]

Current mapping for the software was accomplished by using real-time satellite images from

The views expressed in this report are those of the author and do not necessarily represent the official policy or position of the Department of the Army, Department of Defence or the US government. The Foreign Military Studies Office (FMSO) assesses regional military and security issues through open-source media and direct engagement with foreign military and security specialists to advise Army leadership on issues of policy and planning critical to the US Army and the wider military community.—Editor

"flyovers." This 3-D, moving model of Bosnia's terrain was combined with *PowerScene* software—which purports to have no limitations on image source, scale or breadth. Images from satellites, aerial photographs and other sources were integrated into a seamless image on the screen. Maps and cultural features were worked into the display as well, since the imagery was correlated with real-world coordinates.[7]

Line drawings were digitized . . . and matched to a Defense Mapping Agency 1:50,000 Topographic Line Map, then replicated on a bubble jet printer. The software almost eliminated misunderstanding over boundaries, thereby building confidence, mustering support and saving time. . . [It] also helped coerce the participants by demonstrating to the Serbian, Croat and Muslim leaders that NATO warplanes were very capable of precisely hitting targets if the fighting did not stop.

Working with legal experts, the mappers exported information to an 8-mm tape and hand-carried it to the Joint Topographic Tactical (JTT) Operations Center, located three-quarters of a mile from the delegates quarters, for hard-copy production. Sometimes the information was piped through fiber-optic cables linking the JTT to the Remote Replication System support function to expedite production. The numerous changes kept the mappers very busy, with as many as 600 maps produced a day. Line drawings were digitized and put on a 1:600,000 UN Protection Force road map, where a transparent overlay was created and matched to a Defense Mapping Agency 1:50,000 Topographic Line Map, then replicated on a bubble jet printer.[8] The software almost eliminated misunderstanding over boundaries, thereby building confidence, mustering support and saving time.

An *Aviation Week and Space Technology* article indicated that *PowerScene* had uses other than mapping, however. The journal indicated that *PowerScene* had also helped coerce the participants by demonstrating to the Serbian, Croat and Muslim leaders that NATO warplanes were very capable of precisely hitting targets if the fighting did not stop. That is, the possessor of these technological capabilities linked to simulation and mapping alone was able to demonstrate in a benign form its potential military power. Today *PowerScene* is being used in Bosnia to support command, control, communications and intelligence. If the commanding general wants to know what the road looks like from point A to B, or the line of sight from a mountain, the system is ideal.[9]

After the peace agreement was initialed, representatives from the three sides continued to exploit this virtual reality view of the zone of separation (ZOS).[10] They went on a simulated flight along the 650-mile-long border to determine, in some cases, on which side of a road the boundary should run.[11] The flight lasted nearly 9 hours. Thus, the application of virtual crisis management at Dayton helped eliminate mistrust and disinformation and served as a confidence-building measure.

During the implementation phase, the treaty's reinforcing mechanisms were essential to the peace accords' successful implementation while IT continued to play a major role. Helicopters, equipped with a new method to digitize the attack helicopter's gun-camera footage, exposed *Dayton Accord* violators by photographing their infractions. Occasionally peacekeepers presented evidence of a violation to leaders of the nation or group breaching the *Accord* to compel compliance. At times, cross-hairs were trained on the equipment in the photographs to demonstrate the precision of the technology. The implied message was taken to heart by the transgressors.[12]

IT also connected NATO headquarters with the Implementation Force (IFOR), the Internet kept troops informed of events at home and a Joint Information Bureau (JIB) provided timely information and helped ensure compliance with the *Dayton Accords*. The JIB provided daily advice to the division commander and operated together with the operations, intelligence and civil affairs elements. It has helped manage a multitude of tasks and missions and offered journalists a unified, coherent view of the situation from an IFOR/SFOR (Stabilization Force) standpoint. Clearly a key lesson learned, whether in the negotiation room or in the ZOS, is that in peace operations in Bosnia, "perception is reality."[13] Managing this effort was possible because the agreement was in place before troops were deployed to the field.

Military Goals for Using VPM

The military's goal regarding VPM is to apply technologies to conditions generated by a new world environment, turning this integration into military plans and operations to resolve disputes before they erupt into conflicts. Just as diplomats use virtual processes such as communications and negotiations

A major tenet of *virtual peacemaking* is to "use forces" instead of "force." Here, 1st Armor Division "forces" use *coercive power* against an actual threat in lieu of actual "force." Clearly, the use of forces serves a preemptive role so actual force does not have to be used to create successful conditions for peacemaking.

US Army

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to keep a disagreement "within bounds," the military must use virtual processes to guide or force—when necessary—the militaries of disputing nations away from conflict. Military planners and operators do this by providing channels for anger, providing alternatives to frustration, relieving stress and tension and avoiding overreactions on the one hand and by deterring, monitoring and even compelling disputing militaries on the other.

VPM allows intermediaries to "use forces" instead of force. The military is a power in being with coercive capabilities that create preconditions for peacemaking. That is, the use of forces can serve a preemptive role and prevent the use of force. VPM can also support the rules of engagement (ROE) for the forces called upon to prevent conflict.

The difficulty with VPM is convincing governments lacking IT capabilities that IT is serving *international*, not just national, interests. Yet VPM offers the opportunity for those with extra concerns and anxieties to "monitor the monitors." However, at times the national approaches to conflict prevention are so diverse, due to national attitudes or the participation of peoples and movements instead of states and nations in the national decision-making processes, that it is impossible to keep everyone satisfied.

VPM is not a call for virtual presence—troops are still required. VPM merely strives to control disputes and prevent them from moving to open conflict by exploiting contemporary technology. VPM is a transparent process that offers the following to assist conflict prevention:

- It *explains* the nature or causes of a conflict or measures taken by the international community.
- It *demonstrates* simultaneity of effort or the impotence of those involved in the conflict.
- It *compels* compliance by simulating consequences of actions taken by the participants.
- It can *monitor* and *review* actions for the satisfaction of the participants and the international community.

If the end goal is served, then VPM's value cannot be overestimated. Such a process can even help promote the creation of a global civil society through

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the development and use of common values, something long sought after but deemed unattainable.

VPM and the Current International Environment

An air of optimism regarding IT's assistance to the conflict control process existed after the *Dayton Accords*. IT fostered both confidence and a positive attitude among the sides at Dayton, although the Bosnian Serbs were not part of that process. Can VPM responses be tailored to handle the different causes of conflict, such as race, religion or culture, no two of which may be alike? The 1996 *Second Annual Progress Report* from the Carnegie Commission on Preventing Deadly Conflict cites that some of the most prevalent though not always obvious characteristics are:

- Modern methods for controlling crises use very slow decision-making processes, although progress in streamlining their effectiveness has been noted.
- Crises areas may require military action with humanitarian support or military support of a humanitarian action.
- Crises today, in contrast to the Westphalian system of the past, often require states to consider intervening and violating a country's sovereignty in order to stop military action.
- Some crises today require intervention in an area where no legitimate government is operating.
- Many crises today are far from US shores, do not threaten our national interests and engender little public support.
- Crises often encourage manipulation of the force through "mission creep."
- Many modern crises require close coordination between many different organizations, which has required new organizational techniques to handle military interaction with both government and nongovernment organization (NGO) agencies.
- Contemporary crises require governments to decide if they will support the international peace process, a national interest or a humanitarian cause.
- Crises can demonstrate the power of national will of a country, such as has occurred when a "high-tech" force is faced by an opponent with a "warrior" mentality.
- Major powers are often impotent to act in crisis situations, even with a high-tech force at the ready.
- Regional organizations are sometimes impotent to act in crisis situations, even if they have multinational rapid reaction forces at the ready.
- Crises can develop due to the breakdown of the laws of society and methods for obtaining pay and goods or for religious or ethnic reasons, making use of military force a last option.
- The multidimensional nature of crises makes it difficult to identify the center of gravity (COG) of forces involved in a conflict, especially among paramilitary forces.
- Some crises involving irregular or paramilitary forces have demonstrated little regard for standard warfare procedures or international law.
- Crises can spread within or between countries not initially involved in a conflict, simply over which side to take in the struggle. Any border issue will usually involve military forces.

The Carnegie Commission recently completed a study that outlined factors in today's world that eventually can lead to warfare. The commission offered recommendations to get at the root causes of conflict produced by these circumstances. Finding ways to control conflict is crucial to world stability since local hostilities can become international ones, not in the nuclear sense as in the past, but in the sense that conducting quarrels, no matter how deadly, is an outdated idea. The report cited the following elements that can lead to warfare:

- Political and economic legacies of colonialism and the Cold War.
- Illegitimate government institutions.
- Problematic regional relationships.
- Social cleavages derived from poorly managed religious, cultural or ethnic differences.
- Widespread illiteracy.
- Disease and disability.
- Lack of resources such as water and arable land.
- Patterns of political repression, cultural discrimination and systematic economic deprivation.
- Location of minority populations in economically depressed areas along borders with kindred states.
- Despotic leaders.
- Weak, corrupt or collapsed regimes.

DOD

East Germans pass through Checkpoint Charlie at the 2 a.m. opening of the Berlin Wall on 10 November 1989.

IT has penetrated and evaporated some of the opaqueness that surrounded many countries and made them more transparent to both the outside world and their own citizens. . . . The sovereign . . . has lost control of much of what his people can see and hear, making it more difficult to "form" the consciousness of the populace than in the past. If the essence of sovereignty is the power to exclude others from interfering in one's personal or governmental affairs, then IT is eroding that power.

• The exacerbation of these problems by new global political and economic forces.

The information COG will vary from conflict to conflict, from level to level and from dimension to dimension. The greatest challenge for the policy maker will be to manage a national intelligence architecture that can rapidly identify the information COG, prepare the information battlefield and deliver the appropriate nonlethal information munitions to carry the day.[14]

Despite such difficulties, US Armed Forces leaders support ideas related to VPM, offering potential momentum to the concept and encouraging its integration. For example, Army Chief of Staff General Dennis J. Reimer believes "our analysis for the future points out that we need a capability called *strategic preemption* . . . the ability to halt or prevent a conflict or crisis before it becomes debilitating or protracted—before it spreads out of control."[15] Shaping the international environment is a pillar of our national security strategy. Concepts such as VPM should complement these visions. Obviously, VPM will also require international legal sanction and support, along with considerable foresight and intelligence about the military situation.

During the Cold War, it was more difficult to influence a potential conflict situation and clear up misunderstanding, since many societies operated as closed systems. Government agencies, local businesses, mass media, elites and especially the special organs of intelligence directed a specific flow of information at both principal actors within the system—presidents, prime ministers, general secretaries and society at large. Control of this flow of information from the top down formed the populace's outlook and attitudes.

This situation was directly influenced by limited access to signals, human, photographic and electronic

intelligence and the manipulation of such information for policy formation and execution. Now, this position has changed dramatically as a result of IT and the Cold War's end. While the intelligence systems still impact policy formation and execution, public opinion also matters since many countries, previously bound by pacts of solidarity with closed societies, opened up to the global information market. An entire system known as the Global Information Environment (GIE) developed, mainly through the auspices of businesses and systems designed to monitor various situations, such as arms control, weather and the environment, offering an explosion of communications and other IT that have saturated societies worldwide. There is also a greater ability to manage open-source information from sources around the globe, causing electorates at home and abroad to question even official sources due to access to alternate and comparative information forms.

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On a positive note, IT has penetrated and evaporated some of the opaqueness that surrounded many countries and made them more transparent to both the outside world and their own citizens. The GIE includes individuals, organizations and systems that collect, process and disseminate information to national and international audiences. The GIE is composed of national, global and defensive information infrastructures, impacting all countries, whether they realize it or not, through their use of satellites or other IT sources.[16] Satellites and cables offer outside observers the opportunity to see inside and talk with members of a closed society such as North Korea. Satellites monitor troop mobilizations and deployments, measure the local harvest and ascertain if people will starve or not, allow ordinary citizens to communicate via the Internet with people across the world and afford businessmen the opportunity for instantaneous communication with financial and industrial centers worldwide without government interference. The sovereign, on the other hand, has lost control of much of what his people can see and hear, making it more difficult to "form" the consciousness of the populace than in the past. If the essence of sovereignty is the power to exclude others from interfering in one's personal or governmental affairs, then IT is eroding that power.

VPM offers the international community and individual states the capability to mobilize world opinion and put pressure on governments intent on initiating conflict. The advanced countries are being transformed fastest and in the process are transforming others due to the impact on economic activity. Now, even the most backward societies are touched by the revolution in computing technology and global connectivity. VPM also offers the opportunity for the international community to "signal" what are and are not acceptable norms of behavior and even isolate a government if the need arises. This is especially effective due to IT's instantaneous impact. Now, the opportunity exists to employ virtual diplomatic and economic means or use virtual information blockades or information overloads outside or within a country. Access to outside information also allows the local populace to influence the decision-making processes of a nation through the exertion of public opinion more than ever before.

Walter Wriston, former chairman and CEO of Citicorp, speaking at a conference on Virtual Diplomacy in Washington, D.C., in April 1998, highlighted several intriguing aspects of the new IT environment that military planners must keep in mind. These included the impact of VPM methods on sovereignty, the destiny of people and the development of what he termed an "information standard." His message must be considered and measured by the military as it attempts to fit its methods and hardware to the VPM concept.

Wriston also noted that the entire political process is magnified and sometimes distorted by the images on our TV screens produced instantaneously by IT, especially by the 24-hour international reporting offered by stations such as CNN. This has also affected the way nations communicate with one another, as special interests—both national and transnational—more often bypass official foreign ministry channels. But IT enhances the effectiveness of conflict-prevention measures via the same TV images and access to the Internet. In Bosnia, for example, a legal web page was developed that had a virtual library and electronic publishing format, helping to build the rule of law. Bosnian judges used the system to access ways others handled similar problems. The system tied together not only judges but

also attorneys, clerks and defendants. It may offer a symbiosis of the rule of law, the press and the people for the not too distant future.[17] However, problems of language, different legal systems, methods of legal input and script must be overcome first.

More important, Wriston added, IT offers people a say in their own destiny. The formation of an "information global village" implies that denying people human rights or democratic freedoms no longer means denying them an abstraction they have never experienced. Instead, they are being denied the established customs of the village, which they may have seen on TV or read about over the Internet. Wriston also noted that if the economic market is viewed as a giant voting machine recording in real time the judgment of traders all over the world about our diplomatic, fiscal and monetary policies, then we must be aware of the creation of an "information standard" that is more draconian than the old gold standard and operates more swiftly.[18] The information standard changes the way we solve problems, affects how we do our jobs and, most important of all, changes the way we view and interpret events. Through the phenomenon of instantaneous IT, the information standard loosens the sovereign's hold and projects the individual as the object of events and information as much as the state.

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"Technology empowers people."[19]

If Bosnia is any indicator, the next era of peace operations and conflict resolution will be strongly influenced by the relationship between humans and things virtual. Developers will have to make software that can relate to soldiers, diplomats and people with influence that fits their cultures and expectations. This requires that software manufacturers interact with academicians, religious and cultural leaders and others who understand international sensibilities. It is a significant challenge seldom recognized and one worthy of future study.

This realization comes at a time when consumer electronics, Hollywood, military planning and peacetime actions and societies in many countries of the world all have access to integrated IT systems. The military is buying off-the-shelf technology from the consumer sector, and Hollywood is amazing society with its ability to put the results of this convergence on the big screen. For those Third World societies where access to IT is limited, it is still likely that decision makers have access, which might alter the use of VPM if conflict were imminent but would not eliminate its use.

The next era of peace operations may also witness the capability to customize or tailor IT to fit the contractor, such as a multinational force or the UN. This will make IT potentially useful for peacemaking, peace-enforcement and peace-building operations. *Customizing* means selecting new developments according to their applicability to one type of peace operation, although they could just as easily be adopted for wartime use. For example, Microsoft CEO Bill Gates described three ideas consumers can expect to see in the not too distant future:

- The wallet personal computer (PC).
- Interactive electronic books that offer readers the opportunity to participate in writing the conclusion to the story.
- Advanced software that records each person's "documented life."[20]

Superimposing these ideas on a military scenario allows one to envision, in the first case, an electronic wallet in the pocket of each peace maker that offers instant information on the treaty being implemented or the international law about to be broken, supply and refugee routes available, location of NGO support groups, telemedicine information,

local phone numbers of influential people, ROE, cultural sensitivities and other types of civil-military information. The electronic wallet also could be equipped with read-outs from built in radar detectors, and have the ability to place calls for help that designate both location and real-time images.

Likewise, an electronic book could be used by commanders to access the electronic operations order of a higher level of command in one's own armed forces in order to help write the operations order based on the situation in his locale. Or it might be used to offer conflicting parties a chance to dialogue alone or with a mediator if all parties were electronically connected. Access to one's documented life, in this case the documented steps leading up to a crisis, would allow the participants to review the steps that brought them to their conclusions in the first place.

In Bosnia, for example, a legal web page was developed that had a virtual library and electronic publishing format, helping to build the rule of law. Bosnian judges used the system to access ways others handled similar problems. The system tied together not only judges but also attorneys, clerks and defendants.

If potential combatants wanted to talk over the phone or via a computer in complete anonymity, this is also possible with the help of IT. *Camo-voice*, a communication technology offering such anonymity to the caller, is available. Another communication method is a software package called *Lotus Domino*, which gives a mediator control over who sees what on a monitor. Through such devices of anonymity, presidents or secretaries of state could use the IT tools and conduct the negotiations while appearing to simply be a "representative" of the state in question.

There are many other high-tech tools and software that can be customized for military use as VPM instruments. These include such common everyday items as electronic mail, statistical analysis, graphical illustrations, use of indicators and warnings (or flagging specific words or concept variations) and the use of computer-generated overlays or maps, in addition to such simple devices as video cameras.

Americans are very familiar with the power of images that video cameras have offered over the past few years, whether it was the beating of Rodney King by Los Angeles policemen; the photos of Timothy McVeigh in a Junction City, Kansas, McDonalds, tying him to the rental site of the Ryder truck used in the Oklahoma City federal building bombing; or the footage shot during the beating of Missouri prisoners in a Texas prison. Prison guards report that one of the greatest fears of a prisoner, who has no civil rights, is to be videotaped during a disturbance because it will hurt the person's chance for parole. Some prison officials have even stopped a prisoner from further acts of harm by simply pulling out a camera and pointing it at the individual. They know that the video record will speak for itself at any hearing. Monitoring the outside of military garrisons or sensitive border regions with unmanned aerial vehicles (UAVs) could have a similar impact in recording the actions of countries that violate agreements and presenting the evidence to international tribunals. Again, however, there are legal issues to overcome, in that countries are not prisoners and have no cause to expect violations of their sovereignty or privacy. They have rights not to be spied upon. But if the international legal community agrees that such monitoring is in the cause of preserving peace and eliminating bloodshed, then such "big brother" activity may have a chance, especially since nations routinely observe one another from afar in peacetime through satellites.

Another IT simulation form has real value for VPM. Its adaptation for use in conflict prevention scenarios is quite simple. For example, societies about to become involved in a conflict could be shown a simulation—on local TV if the desire was to mobilize the entire populace—of the good and bad consequences of their deeds. Such a simulation may not necessarily show their destruction. It might simply depict the path leading to war and its consequences for the economy, for example, versus the path leading to peace. This would offer everyone the opportunity to sit back and consider the consequences of their actions and to develop ways to interact and find solutions. Again, the problem will be finding a method to affect different parties in the same way.

Simulations can also be used to prepare the peace maker. If human behavior can be properly modeled, to include its irrational aspects, then computer exercises would be more realistic instead of the preprogrammed responses we have come to expect over the years. These simulations could even be designed for specific locations and environments. As a result, peace operations personnel would

US Army

A patrol questions Kurdish fighters about Iraqi troop movements near Swaratuka, Iraq, summer 1991.

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enter into an area with a much more realistic appraisal of the situation. Thus, simulations are vital because they:

- Provide greater visual realism—sensations of motion, temperature and sound are important but visual imagery is best, especially if put in helmet-mounted displays.
- Offer better and less expensive databases (3-D databases are available as well).
- Provide a broad spectrum of capabilities, allowing planners, individual soldiers and pilots to participate on site or en route.
- Are a more deployable tool and can conduct mission-specific training.
- Offer improved upgradability for lower lifetime costs, allowing users to rehearse various geostrategic settings and rapidly changing scenarios.[21]

Obviously, simulations work for both wartime and peacetime operations, as shown on pages 54 and 55. Speakers at the Virtual Diplomacy Conference offered other examples of how IT can be applied to military peace-making efforts to enhance the effectiveness of these mechanisms. Wriston, for example, noted that IT enables airborne mine detector systems to locate mines and explode them via IT imbedded in drone Panther tanks, demonstrating how information has replaced some human assets. Clearing minefields makes them useless and demonstrates the impotence of those who planted them to influence the situation. Other panelist observations impacting on VPM processes were:

- IT affects the way we conduct military affairs, in that we move faster to "react-act" than in the past due to instantaneous communications and data transfers.[22]
- IT helps us conduct "navigation warfare" to determine locations. It also is a "negotiation weapon" in that precise information in real time offers an advantage in decision making. UAVs are an example of technology that can provide this information.[23]

Just as Bill Gates adapts these concepts to the life of the consumer, soldiers and diplomats should begin exploring their application to conflict-prevention mechanisms. . . . VPM is in need of further elaboration, especially since the military and consumer sectors are converging, implying one can assist the other in helping to prevent conflict.

• IT enhances diplomats' understanding of the history, training, biological processes and learning techniques of a nation, not just their peoples thoughts and the things they want today. We need to learn to connect data perceptual systems.[24] This lesson should be studied by psychological operations (PSYOP) personnel.

• IT can also allow one to look at roots of conflict associated with geography, such as natural resources, land, food, water, high ground, space, the environment, movement corridors, strategic locations or cultural objects. A Geographic Information System can help resolve conflict by offering a number, quality and diversity of global databases which have peacekeeping/peacemaking implications

Virtual Peacemaking Systems and Devices

There are other devices that must be considered as agents of virtual peacemaking as well. Some are pieces of hardware and some are software. They include the following:

CD games with emotions, religion, culture. On computer games today we can see the bodies—the clothing, the faces—so the personality of the characters is naturally becoming a bigger part of the game design. CD games are beginning to make characters dominant or appealing, and to include other personal sensitivities such as emotions. There is little reason why these technologies cannot be used as a virtual peacekeeping means. For example, during negotiations or initial discussions, it might mean allowing the sides to confront one another through this process and witness firsthand some of the distress or pain their actions might cause.

Public forums. Usually taking place on a web page, public forums offer participants a place to explain the logic of their distress and thought processes. It is also a great place for the display of images, video, sound, and so on. This discussion may be conducted by academicians, diplomats or any other credible group. The key problem will be finding acceptable artificial intelligence that can accurately portray the opposing sides and run the game. Any gamer magazine shows that there are big problems in these areas.

Dual language software. Already under development, this software could be used to integrate culture-specific terminology and sensitivities with peace operations concepts of the sides. This is important because not all sides use the same words and concepts in the same way. Most potential conflict situations will certainly be multilingual.

Digital artists. These people are creating culturally oriented scenes to accompany landscapes, which will make the message and image more appealing to the reader. Naturally, it is almost pointless to have someone other than a local inhabitant create these scenes.

Digital cameras. Similar in use to the video camera, they can use wireless infrared technology or snap into your PC. This allows a person to send back photos instantaneously as if he had a movie camera that only made still photos. This will help quickly inform people of developing situations, allow for the instantaneous indexing of potential trouble makers (if legal authorities permit you to do so), and so on.

Hand-held fax readers. These devices allow you to send, receive and view faxes on the road. You even can receive long operations or fragmentary orders under such conditions, or offer situation reports supported by drawings or documents. Time to get material back to headquarters can easily be cut by over 100%. For example, the Philips Velo 1 is an example of advanced technology with peacemaking potential. It is a palmtop with a built-in modem and fax-send capability as well as an integrated digital voice recorder and browser capable of reading images of most web pages at reduced scale. Peace operations personnel could theoretically even get onto the homepages of the sides in confrontation to try and calm them or offer options.

Computer-aided design. This type of software lets designers and engineers make 3-dimensional models of almost anything. Terrain, buildings and other objects can be modeled to offer a virtual reality climate in which to make proposals and decisions.

MapLinx. This software develops automatic displays of customers, prospects, sales, marketing or other data on detailed maps. It is possible to view the entire country or zoom down to a local neighborhood. With a single keystroke, it may be possible to map religious and ethnic groups, cultural and historical sites and highlight electrical and water sources. This item would be especially useful to virtual peacemakers conducting civil-military operations.

Lotus Domino. This is software that allows you to control who sees what, and who can make changes to what they see. It offers a degree of confidentiality and security during intense or sensitive consultations over open lines.

Personal video products. In addition to video cameras, these products now include video teleconferencing that provide a virtual environment in which all partici-

for combatants. It also shortens the time lag between collecting and using, interrelates available information and can achieve any factor of reality in a reference base.[25]

- IT has assisted the mapping industry to enable us to communicate intuitively, since maps offer a framework for compromise and trade-offs and can show such things as flood plains overlaid on property, buffer zones around rivers and line of site for communication sites, just to name a few.[26]
- IT can model biological processes, hydrological processes and the movement of animals or humans, among other things, and offers a framework for cooperation between academia, business, NGOs, government, military and citizens.[27]

[Dayton] was the finest hour to date in preventing conflict through virtual means. The Dayton process added credibility to VPM's potential to become an important conflict-prevention tool. However, we must remember that managing this effort was possible because the agreement was in place before troops were deployed to the field.

pants sit around the same table. As was discovered during the Paris Peace Talks to end the war in Vietnam, cultural sensitivities also need to be taken into account here, in this case the size and shape of the tables, which could be modified if video teleconferencing was used to fit what the participants see. Edited video or still images and personal video conferencing are other options.

Intelligent agents. These agents are actually programs that adapt to preferences of the user, even making decisions on their behalf (for example, a refrigerator alerts you that you need cheese. Such a system could find use as a warning system for surveillance UAVs or other monitoring or sensing devices).

Other technology includes:

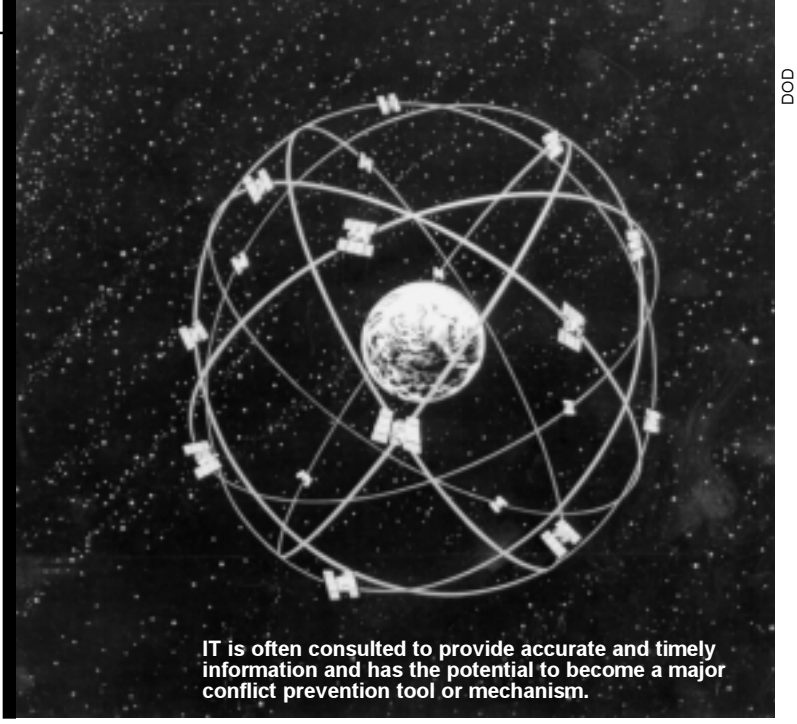
- Some software allows you to work over your PC like a phone. That is the electronic wallet discussed earlier which could also serve as a telephone.
- The ability to create homepages accessible to spiders-software programs that prowl the web as part of a search engine. To attract spiders, one needs to take advantage of meta tag-lines of code in which programmers put private comments or key words, which spiders read vociferously.
- Cyber shot cameras that store images on chips which can be transferred to a VCR or a personal computer.
- A portable head-mounted video player, the *Glasstron*, which may do for video what the *Walkman* did for audio. It could be used as a simulator as a soldier walks in a mock-up village or to receive news updates and images on the battlefield.

Finally, consideration must be given to the multitude of high-tech "spy stuff" that can be used in conflict prevention. These devices include, but are far from limited to, the following:

- *Camo-voice:* which is a digital voice masker for telephone calls. If a party to a conflict does not want to be identified, he can use this device to talk to parties on the other side in anonymity.
- *Phone safe:* a device that can be engineered to identify and defeat eavesdropping devices.
- *Theft-detection powder:* which shows up under ultraviolet light and could be used as a verification device to prevent forgeries from being exchanged between two sides.
- *Heat stalker:* which can sense heat up to 100 feet. It can be used along with sensors in zones of separation.

For operations other than war (OOTW) scenarios, there are also more specific tools that employ information technology. Some of the nonlethal means recommended for application to conflict prevention scenarios in the sense of compellance (and likely adaptable to virtual peacemaking) are:

- *Soldier tracking and warning systems:* system transmits a soldier's position back to HQ, and provides warning to a soldier who gets out of his area or too far from HQ via a beeping signal. Can also be used to track friendly or hostile vehicles and individuals.
- *"Lifeguard" antisniper Infra Red system:* uses sensors to track the heat of a sniper's bullet back to the point of origin. Has some applicability to rules of engagement as well.
- *People/vehicle/metal sensors along borders:* system can distinguish between people, metal, people carrying metal, and so forth, up to a range of several hundred meters.
- *Hover UAVs:* air-breathing vehicles that can remain stationary or nearly stationary and provide long-endurance (several to many hours) sensor platforms. Serve as "local area satellites."
- *Magneto Hydro-Dynamics:* use electromagnetic power impulses for a variety of actions, such as disabling equipment and stopping vehicles.
- *High-power, low-frequency sound systems:* systems that disable humans by causing intestinal distress and disorientation. Testing involves ethical and political ramifications.
- *High-intensity lights/laser weapons:* systems that can flash-blind people or disable optical and infrared systems.
- *Stink bombs: nontoxic* substances which are illegal under the Chemical Weapons Convention.
- *Sticky foam/deployable nets:* systems that stop or impede human passage or activity by creating barriers.



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IT is often consulted to provide accurate and timely information and has the potential to become a major conflict prevention tool or mechanism.

While on patrol in Bosnia, a US Army lieutenant colonel was confronted by an irate Croat who, with an old map in his hand, told the officer that he was on Croation territory. Referring to his own map, the officer replied that he was not and offered to go one step further to prove his point. Taking out his GPS, he entered data and showed the Croat the results. "Sir," the officer said, "I have consulted the cosmic tribunal (three satellites) and they have proved me correct. Excuse us, we have to continue with our mission."

- IT enhances TV coverage, influencing measures of military success.[28]
- IT is heightening our view of the unusual—the meshing of seemingly incongruous elements—which is making us more tolerant of "different" thinking about an issue.[29]
- IT should discourage us from thinking in terms of platform versus platform. Adversaries will not build pieces in that manner. Due to change, chaos and complexity, we can not predict events precisely, but we must be ready for all possible contingencies.[30]
- IT has created greatly flattened bureaucratic structures to implement conflict-prevention processes. Diplomats and the military must also learn how to work with this apparatus.

The future promises excitement and opportunity to those who harness IT. Will concepts such as VPM be part of that future? Hopefully, this article has demonstrated that the capability exists and that it is a worthwhile cause. First, there is a wealth of ideas, technologies and software applications with direct applicability to conflict-prevention practices and theory. Some are as common as E-mail and the Internet, others as specific as *MapLinx* and *Lotus Domino*. Just as Bill Gates adapts these concepts to the life of the consumer, soldiers and diplomats should begin exploring their application to conflict-prevention mechanisms.

Hence, these technologies enable "strategic preemption." This means that the VPM concept is applicable to conflict-prevention theory spanning the tactical-to-strategic scale. Further, it offers a new tool to political scientists, soldiers and diplomats to develop their models and IT uses. Of course, preemption has a purely military use as well—escalation domination to protect US interests—but this is not its VPM intent. Far too little time has been devoted to this topic to date. While we have examined and used IT as a crisis-management mechanism, rarely have we looked at it as a conflict-prevention mechanism. VPM is in need of further elaboration, especially since the military and consumer sectors are converging, implying one can assist the other in helping to prevent conflict.

It is important that software manufacturers be made aware of the crucial role they can play in this effort. Academicians, religious and cultural leaders and others who understand international sensitivities should work closely with software producers to develop products that consider the terminology, cultural specifics and concepts associated with international negotiation processes. For example, Russian and US peace operations terminology can have varying differentiations that must be taken into account as well as cultural and political peculiarities. Only talented people with the proper guidance can develop the software required for such specificity.

VPM can take advantage of a phenomenon of the new world order, namely that many formerly closed societies are now more transparent due to IT. Whether it be E-mail, the Internet or cellular phone linkups, the world is more integrated than at any other time in history, offering opportunities to use VPM tools to assist in deterring, blocking, pacifying and controlling conflict.

While there are as many dangers as there are advantages to IT's use, the dangers are controllable. Some believe that we, the IT tool makers, have made the tools so simple that anyone can use them—even to destroy the tool makers! These include terrorists' access to IT, and the ability to employ IT in PSYOP against any country or group. One recent PSYOP example in the United States involved an E-mail of a speech reportedly delivered by author Kurt Vonnegut at a commencement address. Filled with pearls of dry wisdom, it was passed around the country. However, the message

was a fraud, written by a journalist, but it demonstrated how vulnerable everyone is in the age of IT. Of course, other very real dangers are posed by hackers and the friction and fog of information war.

In Dayton, it was demonstrated that the possessor of IT, linked to simulation and mapping alone was able to demonstrate in a benign form its potential military power. This was the finest hour to date in preventing conflict through virtual means. The Dayton process added credibility to VPM's potential to become an important conflict-prevention tool. However, we must remember that managing this effort was possible because the agreement was in place before troops were deployed to the field.

There are numerous other problem areas to address in future discussions on this subject, but despite the problems, limitations and dangers associated with VPM, it still appears to be a subject worthy of further exploration. Better to start studying the positive uses of the information revolution to prevent conflict now and find ways to monitor potentially dangerous groups before it is too late. This includes groups on the Internet who invade personal privacy, invite you to participate in illegal behavior or ask you to complicate police investigations and criminal cases. A recent report indicated that some citizens are taking it upon themselves to impose their own version of law and order on the largely unregulated Internet. There is even a group called "Cyberangels," an offshoot of the New York City Guardian Angels, seeking out potential offenders and those who would take advantage of other "netizens." In the past year, web pages such as "Women Halting Online Abuse" were developed, as well as hundreds of others.[31] And, these problems arise at a time when we are already slipping away from silicon technology to DNA, molecular or quantum computing. Time is of the essence. ***MR***

Some prison officials have even stopped a prisoner from further acts of harm by simply pulling out a camera and pointing it at the individual. . . . Monitoring the outside of military garrisons or sensitive border regions with UAVs could have a similar impact in recording the actions of countries that violate agreements and presenting the evidence to international tribunals. Again, however, there are legal issues to overcome, in that countries are not prisoners and have no cause to expect violations of their sovereignty or privacy.

NOTES

1. Kenneth Allard, "Information Operations in Bosnia: A Preliminary Assessment," *Strategic Forum*, Institute for National Strategic Studies, No. 91, November 1996, 1-4.
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3. W. Wayt Gibbs, "Taking Computers to Task," *Scientific American* (July 1997), 84.
4. Richard Solomon, Conference on Virtual Diplomacy, Washington, DC, 2-3 April, 1997. This definition was generated by collating the main ideas from two definitions, that of virtual diplomacy and that of peacemaking. At the opening session of a conference on Virtual Diplomacy, United States Institute of Peace President Richard Solomon defined virtual diplomacy as "an exploration of how our world is being transformed by the global information revolution, one that assesses new technologies of data processing and communication to prevent, more effectively manage or resolve international conflict." He added that virtual diplomacy is designed to help us explore the possibility to decrease conflict through virtual processes of information gathering, analysis and communication.
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6. "DMA Support to the Peace Talks," Online. Internet. 15 March 1997, p 1 at <http//www.dma.gov/inf¼acts/site/mappers.html>.
7. *PowerScene*, advertising overview handout, November 1995.
8. "DMA Support to the Peace Talks," 2.
9. Joseph Anselmo, "Satellite Data Plays Key Role in Bosnia Peace Treaty," *Aviation Week and Space Technology* (11 December 1995).
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11. Eric Schmitt, "High Tech Maps Guided Bosnia Talks," *The New York Times* (24 November 1995), 1.
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16. FM 100-6, *Information Operations* (Washington, DC: GPO, August 1996), 1-2.
17. Henry Perritt, Villanova University School of Law, comment made during his presentation at the Virtual Diplomacy Conference.
18. Walter Wriston, "Bits, Bytes, Power and Diplomacy," speech presented at the Virtual Diplomacy Conference in Washington, DC, 1-2 April 1997.
19. Chester Crocker, Georgetown University, comment made during his presentation at the Virtual Diplomacy Conference.
20. Bill Gates, "The Road Ahead," *Newsweek* (27 November 1995), 61.
21. Jim Oyler, "The Battlefield in Your Brain," *Military Training Technology* (June/July 1997), summary on 8-11.
22. Anita Jones, Defense Research and Engineering, the Pentagon, comment made during her presentation at the Virtual Diplomacy Conference.
23. Ibid.
24. Mark Weiser, Xerox Palo Alto Research Center, comment made during his presentation at the Virtual Diplomacy Conference.
25. Jack Dangermond, Environmental Systems Research Institute, comment made during his presentation at the Virtual Diplomacy Conference.
26. Ibid.
27. Ibid.
28. LTG Anthony Zinni, US Marine Corps, comment made during his presentation at the Virtual Diplomacy Conference.
29. Arno Penzias, Bell Labs/Lucent Technologies, comment made during his presentation at the Virtual Diplomacy conference.
30. LTG Paul Van Riper, US Marine Corps, comment made during his presentation at the Virtual Diplomacy Conference.
31. Bill Golden, with an E-mail address of wgolden@psrw.com, with more information available at: <http://headlines.yahoo.com/thirdage/stories/8731019242.html>.

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